

No 0000013



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# **FIELD INVESTIGATIONS OF UNCONTROLLED HAZARDOUS WASTE SITES**

## **FIT PROJECT**

**TASK REPORT TO THE  
ENVIRONMENTAL PROTECTION AGENCY  
CONTRACT NO. 68-01-6056**

**MITRE MODEL SCORING**

**OF**

**SKINNER LANDFILL**

**OHIO**

**TDD No. HQ-8109-01**

**Submitted by: Gary P. Clemons, Ph.D.  
Submitted to: Steve Caldwell**

**23 October 1981**

**ecology and environment, inc.**

**International Specialists in the Environmental Sciences**

Site Name: Skinner Landfill

Location: West Chester, Ohio

ROUTE - GROUNDWATER

Scores

Measured Level or Evidence of Release	Original	Fill	Diff
Potential	45	0	45
Depth to Aquifer of Concern		3	
Net Precipitation		2	
Permeability of Unconsolidated Fills		2	
Contaminant		3	
Physical State	3	3	-
Potential	3	3	-
Toxicity/Infectiousness	3	3	-
Total Waste Quantity	5	5	-
Ground Water Use	3	2	1
Distance to Nearest Well Downgradient by Population Served by Ground Water within 1 Mile Radius	3	3	-
	2	3	1

GROUNDWATER ROUTE SUBTOTAL

40.75 53.46 12.71

ROUTE - AIR

Scores

Evidence of Release	Original	Fill	Diff
Physical State/Volatility	45	0	45
Reactivity			
Permeability			
Toxicity/Infectiousness			
Distance to Nearest Population			
Population Within 1 Mile Radius			
Critical Environments			
Land Use			

AIR ROUTE SUBTOTAL

44.23 0 44.23

ROUTE - SURFACE WATER

Scores

Measured Level or Evidence of Release	Original	Fill	Diff
Site Slope and Terrain	0	0	-
1 Year 24 Hour Rainfall	3	3	-
Distance to Surface Water	2	2	-
Flood Potential	3	3	-
Contaminant	0	0	-
Surface Water Use	2	3	1
Critical Habitats	1	2	1
Population Served by Surface Water Intake Within 1 Mile Radius	0	0	-
Distance from Site	0	0	-

SURFACE WATER ROUTE SUBTOTAL

2.3 6.91 4.61

AGGREGATE SITE RANKING

44.65 32.01 12.64

REASONS FOR SCORE DIFFERENCES  
(Use either side if necessary)

NAME OF REVIEWER:

R. Bartholomew

# III E RATING DISCANCIES

SITE NAME: Skinner Landfill, OH R. Bartholomew

Rating Factor	EPA or State Score	QA Score	Difference	Reasons for Difference
gw Evidence of Release	45	30 potential	15	gw data negative at nearby wells
Targets: gw use	3	2	1	Municipal water is available
Pop. Served	2	3	1	County Health Dept. indicates 90% of population on municipal water (used census fig.)
SW Containment	2	3	1	Open leagoon no evidence of liner
Potential for Release	16	24	8	see containment
SW Targets	1	2	1	There is some fishing/recreational use
SW Subtotal	60.75	44.55	16.2	see above
SW Subtotal	2.3	6.9	4.6	see above
Air Subtotal/Release	45	0	45	Air release based on census of number of sampling team

see summary sheet!

Project Summary

Skinner Landfill is located in West Chester, Ohio (Butler County) and is owned by Mr. & Mrs. Albert Skinner and Sons. This site was used as a sanitary landfill for several years before it closed around 1970. Reportedly Mr. Skinner disposed of some phosphorous, nerve gas, cyanide sludges and various types of demolition bombs at this site.

In late 1975 early 1976, Spray-Dyne company an aerosol and anti-freeze manufacturer, was destroyed by fire and moved to and became Chem-Dyne. Mr. Skinner was involved with Chem-Dyne; tank rigging, some barrel disposal, and tank truck cleaning operations. It is suspected that some of the wastes from Spray-Dyne and Chem-Dyne was disposed of by Mr. Skinner. These wastes were placed in an open lagoon on a 30 foot tall hill next to a small creek and were stored on the ground. A fire on Mr. Skinner's property alerted the local fire department to the existence of these lagoons. Ohio EPA went to investigate this site and were evicted from the property. A search warrant was obtained by Ohio EPA but entry to the site was blocked by heavy equipment on the roadway. Another warrant was obtained by Ohio EPA. There were several bomb threats and death threats made by the Skinners, and the lagoons were covered with 12 to 20 feet of earth. A team composed of the U. S. Army demolition/bomb squad, USEPA and Ohio EPA visited the site under warrant in May 1976. They dug into the old lagoon, and found highly toxic C-56 manufacturing sludge waste byproduct, from Velsicol Chemical via Chem-Dyne tank trucks. They also found drums of solvent, plating waste and cyanides.

There has been no activity at the site since 1976. No one from the OEPA has been there since early 1977. The site should be re-investigated under law enforcement escort.

The site will probably leach into Mill Creek sooner or later. Additional monitoring wells should be drilled and runoff sampled. The site should then be re-capped and the materials removed.

Scope of Work:

1. Sample runoff, install monitor wells.
2. Re-cap site and/or
3. remove C-56 chlorinated materials and cyanides.

Option 1 or 2 should cost less than \$100,000, and should be accomplished as soon as possible.

If the materials are required to be removed, the costs will exceed 1,000,000 and will probably approach 3 to 4 million dollars.

Status of Litigation

Ohio EPA and the State's Attorney General's Office filed suit against Skinner

Skinner Landfill  
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to force clean up of the site. Monitor wells, and a geological survey of the site was made by H. C. Nutting and Ohio EPA.

The court ruled that while toxic waste has been buried there, it was not proven that the waste would get off-site. The Judge ruled the site a potential, not an actual threat.

Skinner Landfill  
E-1 - E1

ROUTE - GROUND WATER

Rating Factor	Basis of Information	Site Rating (Circle One)	Multplier	Site Score	Maximum Possible Score
<b>1 OBSERVED RELEASE</b> (ref GW 1)					
Measured Level of Substance or Release		0 1 2 3 4 5	1	0	5
If the site score is zero, go to step 2 otherwise, go to step 3					
<b>2 ROUTE CHARACTERISTICS</b> <sup>1</sup> (ref GW 2)					
Depth to Aquifer of Concern		0 1 2 3 4 5	2	6	5
Net Precipitation		0 1 2 3 4 5	1	0	5
Permeability of Unsaturated Zone		0 1 2 3 4 5	2	4	5
Subtotal				10	15
<b>3 CONTAINMENT</b> <sup>1,2</sup> (ref GW 3)					
Containment		0 1 2 3 4 5	1	3	5
<b>4 POTENTIAL FOR RELEASE</b>					
Multiply site score from 2 by site score from 3. The product is site rating for this route.			1	30	45
<b>5 RELEASE</b>					
Enter site score from 1 or 4				30	45
<b>6 WASTE CHARACTERISTICS</b> <sup>1,2</sup> (ref GW 4)					
Physical State	liquids	0 1 2 3 4 5	1	3	5
Reactivity	explosive	0 1 2 3 4 5	2	6	5
Toxicity/Infectiousness		0 1 2 3 4 5	2	6	5
Subtotal				15	15
<b>7 HAZARDOUS WASTE QUANTITY</b> <sup>1</sup> (ref GW 5)					
Total Waste Quantity		0 1 2 3 4 5	1	5	5
(1) By Subtotal (including waste that is easily contained)					
<b>8 TARGETS</b> <sup>1</sup> (ref GW 6)					
Ground Water Use		0 1 2 3 4 5	3	6	5
Distance to Nearest Well Downgradient	Skinnerwell	0 1 2 3 4 5	3	9	5
Population served by Ground Water within 1/2 mile Radius		0 1 2 3 4 5	1	18	25
Subtotal				33	45
<b>9 GROUND WATER ROUTE SUBTOTAL</b>					
A. Multiply 3 x 5 x 7 x 8				30 x 15 x 5.33	74250
B. Multiply (A.) by Normalization Factor of 0.6 and Divide by 1,000				0.6	44.55

<sup>1</sup> A rating of zero should be entered when data is unavailable to rate an objective factor. A rating of 1 should be entered when data is unavailable to rate a characteristic category such as the waste quantity or containment. A rating of 25, resulting from the entire site is entered when rating a site.

For the site use more than one type of containment (e.g., surface impoundment, single containment, secondary containment) use the score from the worst case.

Use the site's most hazardous waste. Select the one with the highest subtotal score and enter that score.

# ROUTE - SURFACE WATER

Rating Factor	Basis of Information	Site Rating (Circle One)	Multiplier	Site Score	Maximum Possible Score
<b>1 OBSERVED RELEASE</b> <small>per SW 1</small>					
Measured level or exposure of release		0 1 2 3 4	1	0	4
If the site score is zero, go to step 2 otherwise, go to step 5					
<b>2 ROUTE CHARACTERISTICS</b> <small>per SW 2</small>					
Site Slope and Terrain		0 1 2 3 4	1	3	3
1 Year 24 Hour Rainfall		0 1 2 3 4	1	2	3
Distance to Surface Water		0 1 2 3 4	1	3	3
Flood Potential		0 1 2 3 4	2	0	8
Subtotal				8	16
<b>3 CONTAINMENT</b> <small>per SW 3</small>					
Containment		0 1 2 3 4	1	3	3
<b>4 POTENTIAL FOR RELEASE</b>					
Multiply site score from 2 by site score from 3. The product is site rating for this route.			1	24	48
<b>5 RELEASE</b>					
Enter site score from 1 or 4				24	48
<b>6 WASTE CHARACTERISTICS</b> <small>per SW 4</small>					
Physical State		0 1 2 3 4	1	3	3
Toxicity/Interference		0 1 2 3 4	2	6	8
Persistence	C-56	0 1 2 3 4	2	6	8
Subtotal				15	16
<b>7 HAZARDOUS WASTE QUANTITY</b> <small>per SW 5</small>					
Total Waste Quantity		0 1 2 3 4 5	1	5	5
<small>By Superfund definition including waste that is stably contained</small>					
<b>8 TARGETS</b> <small>per SW 6</small>					
Surface Water Use	fish/recreation	0 1 2 3 4	3	6	9
Critical Habitat		0 1 2 3 4	2	0	8
Population Served by Surface Water (with water intake within 3 miles downstream from site)	check	0 1 2 3 4 5	6	0	30
Subtotal				6	48
<b>9 SURFACE WATER ROUTE SUBTOTAL</b>					
A. Multiply 8 x 6 x 7 x 8				24 x 15 x 5 x 6 = 10900	131.875
B. Multiply [A.] by normalization factor of 0.84 and divide by 1,000				0.84	6.91 (B.1 Route Subtotal)

ROUTE - AIR

Rating Factor	Basis of Information	Site Rating (Circle One)	Multiplier	Site Score	Maximum Possible Score
<b>1 OBSERVED RELEASE<sup>1</sup> ref A 11</b>					
Evidence of Release		0 1 2 3 4 5	1	0	45
If the site score is zero, the route subtotal score is zero, otherwise, go to Step 2					
<b>2 RELEASE</b>					
Enter site score from 1					45
<b>3 WASTE CHARACTERISTICS<sup>1,2</sup> ref A 2</b>					
Physical State, Volatility		0 1 2 3	1		3
Reactivity		0 1 2 3	1		3
Incompatibility		0 1 2 3	1		3
Toxicity, Infectiousness		0 1 2 3	2		6
Subtotal					15
<b>4 HAZARDOUS WASTE QUANTITY<sup>1</sup> ref A 3</b>					
Total Waste Quantity		0 1 2 3 4 5	1		5
by Subtotaling common excluding waste that is already contained					
<b>5 TARGETS<sup>1</sup> ref A 4</b>					
Distance to Nearest Population		0 1 2 3	2		6
Population Within 1 Mile Radius		0 1 2 3 4 5	5		25
Critical Environments		0 1 2 3	2		6
Land Use		0 1 2 3	1		3
Subtotal					40
<b>6 AIR ROUTE SUBTOTAL</b>					
A. Multiply 2 x 3 x 4 x 5					135,000
B. Multiply (A.) by normalization factor of 0.72 and divide by 1,000				0.72	97.2
B. Route Subtotal					

<sup>1</sup>Only air monitoring data will be considered as evidence of release.



10 AGGREGATE SITE RATING			
Route	Route Subtotal from 6 or 9	Route Subtotal Squared	Maximum Possible Score
Ground Water	44.55	1984.70	$(97.2)^2 = 9447.84$
Surface Water	6.91	47.75	$(97.2)^2 = 9447.84$
Air	0	0	$(97.2)^2 = 9447.84$
Sum		2032.45	28,343.52
Square Root of Sum		45.08	168.36
Overall Score* =	$\frac{\text{sum} \times 100}{168.36}$	26.77	100

FIRE AND EXPLOSION	
Route Subtotal from 8	Maximum Possible Score
	97.2
Adjusted Score =	$\frac{\text{Route Subtotal} \times 100}{97.2}$

DIRECT CONTACT	
Route Subtotal from 8	Maximum Possible Score
	97.2
Adjusted Score =	$\frac{\text{Route Subtotal} \times 100}{97.2}$

\*The overall and adjusted scores will be between 0 and 100. The maximum overall score for a site with only one exposure route is 57.7.

WORKSHEET FOR HAZARDOUS WASTE  
SITE RANKING MODEL

FIT QUALITY ASSURANCE TEAM

GENERAL

Site name and location: Skinner Landfill  
West Chester, Ohio

Date(s) of site scoring:

Review 8-17-81

Primary source(s) of information (e.g., EPA region, state, FIT, etc.):

Ken Harsh OEPA Columbus, OH U.S. Census figures  
EPA-V Butler County Health Dept.  
FIT

Ohio Attorney General Office - Colleen Nissl  
Factors not scored (assigned 0 for additive and 1 for multiplicative)  
due to insufficient information:

Comments or qualifications:

Record does not indicate gw or sw contamination

Most of the <sup>organic</sup> compounds detected <sup>in pit</sup> are not water soluble

Calculated waste quantity is conservative based upon testimony  
by aerial flyover. - Changed 8-26-81 per S. Caldwell to give  
state benefit of doubt to calculate volume of a lagoon.

Colleen K. Nissl, AAG - waste quantity -

## GROUND WATER PATHWAY

### 1 Measured Level or Evidence of Release

Describe substance(s) and nature of release:

*None*

Describe method of measurement or observation:

*no <sup>positive</sup> quantitative measurements of gw contamination*

### 2 Depth to Aquifer of Concern

Describe/name aquifer of concern:

*sand/gravel aquifer contains shallow water supply drawn by a few local residents.*

Why is above aquifer of concern?

*Probably well discharge to surface water East Fork and possible contamination of deeper aquifer in limestone shale*

Depth and how determined, including sources:

*DEPA Geology Reports static level at 620-645 MSL*

### Net Precipitation

Net precipitation and how determined, including source(s):

*-12 based upon Nitic maps*

### Permeability of Unsaturated Zone

*10<sup>-3</sup>*

Soil type(s) in unsaturated zone:

*sandy, silty clay, fine to coarse sand & gravel limestone fragments*

Permeability and how determined, including source(s):

*H.C. Nutting, contractor report of <sup>shallow</sup> borings made on site at 5 locations. Chose 10<sup>-5</sup> as best guess*

**3** Containment

Method of waste management (e.g., surface impoundment, landfill, etc) of extreme case:

Describe basis for selecting extreme case:

surface impoundment lagoon has no liner contains coke and leaking drums

Describe method(s) of waste or leachate containment for above extreme case:

None

Cite source(s) of information:

OEPA reports from various inspections

**6** Physical State

Physical state of waste and source of information:

Liquids, one-slug, and solids

Persistence

Most persistent compound subject to transport via ground water:

trachlorobutadiene

Basis for selecting compound, including source(s):

Mitre table from JRB Assoc

Known solubility

Basis for selecting persistence rating score:

Mitre judgment halogenated hydrocarbons

Toxicity/Infectiousness

Toxic materials subject to transport via ground water and Sax or NFPA level for each:

see attached work up

# Skinner

Ooze

Sol

Tox

Pers.

Phys. stud  
Vol

Trichloro propane

ins.

2

3

3

8

Dichloro benzene

ins.

2

3

3

8

1,3 Hexachloro butadiene sol

3

3

1

6

Napthalene

no

2

1

0

3

Hexachloro cyclopentadiene sol.

3

0

3

6

Methyl Napthalene

no

3

1

3

7

Iso. Butyl Benzolate unknown

Hexachloro nor-Bornadine unknown

Octachloro-cyclo-pentene "

"

Heptachlor nor-Borene "

Hexachloro benzene

2

3

0

5

Chlordane

unknown

Methyl Benzyl Phenone "

Octachlor penta fulvalene

Cyanide

3

Plating Waste

## \* Reviews of Environmental Effects of Pollutants XII

Hexachlorocyclopentadiene 600/1-78-047 (12-78)

hydrolyzes easily

degrades under basic pH

Cite source(s) of information indicating toxics present on site:

OEPA analysis of ore & battery samples

Hexachlorocyclopentadiene  
buta diene

(3)

Methyl Naphthalene

Infectious materials present on site and source(s) of information:

None

Basis for selecting CDC classification of infectious materials:

7 Total Waste Quantity

Total waste quantity present, including unit of measurement (e.g., tons, cubic yards drums): Unknown

200-300 drums

Basis for estimating or computing quantity, including source(s) of information:

Lagoon volume calculated at 18,000 yd<sup>3</sup>

Witness testified from aerial photos of hundreds of drums

8 Ground Water Use

Use(s) of aquifer of concern and source(s) of information:

Distance to Nearest Well Downgradient

Distance to nearest well downgradient: [2,800 feet] to offsite well  
Skinner Well on site used for ranking less 2000'

How was downgradient direction(s) established, including source(s) of information:

OEPA Report of Geology & Groundwater Resources of West Chester, OH

How was distance determined?: U.S. top. sheet 515446 Quad

Is nearest building known to be using ground water? Source of information:

Skinner building allegedly use water

K. Hersh OEPA

Is nearest well known to be drawing from aquifer of concern? Source of information: *No OERR Geology Report*

*not counting Skinner well*

Population Served by Ground Water Within 3-Mile Radius

Population served with 3-mile radius: *90-95% population on municipal water.  $19,500 \times 10\% = 1,950$*

How was population counted or computed, including source(s) of information: *OERR geologist Jim Penno  
Butler County Water & Sewer, Tony*

Is population known to be served by aquifer of concern? Source of information:

*No. check*

1968-1974  
Glendale and 1974

# Skinner Population Bias

includes communities:

Pisgah  
N. edge of Sycamore  
West Chester  
Tylersville  
Haud

0 partial section

o 13 - 12

19 - 28

25 - 12

o 18 33

x 24 200

x 30 142

36 39 - 166

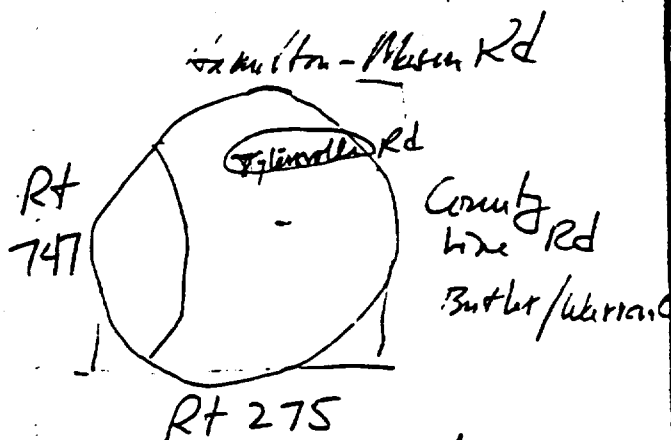
17 - 63

x 23 2150

x 29 77

x 35 - 11

16 - 200 - 2967 x 38 individuals = 11,274  
Relative Density 521 / section



90% population on municipal  
10-12 miles City Hamilton - Great Miami  
Aqueduct 100 mi  
1970-1980 Twp increase 8490  
1980 twp 23,553

25 sections x 521 = 13,000 by 1974 standard

8.4% / yr over 10 years

1 year increase  
over

13,000 x 50.4 = 19,500

≈ 19 sections on Glendale  
= 6 " Mason

25



Area contains  
Several Schools  
Township School across from Skinner  
large apt. complex  
sprawling suburban development  
U.S. Army Reservation  
Major Interstate Hwy 1-75  
Transfer Parks

Area has 1950 on gw calculated by  
figuring 10% of population not on municipal supply  
from county health dept.

**SURFACE WATER PATHWAY**

**1 Measured Level or Evidence of Release**

Describe substances and nature of release:

*None detected*

Describe method of measurement or observation:

**2 Site Slope and Terrain**

Computation of slope and description of points of measurement:

Cite source(s) of information (topo maps, etc.):

*Topo map*

**1-Year 24-Hour Rainfall**

Amount of rainfall and source of information:

*3" Supplied Charts*

**Distance to Surface Water**

Distance and description of points of measurement:

*Distance to E. Fork Creek calculated to be 1120'*

Cite source(s) of information:

*U.S. top sheet*

**Flood Potential**

In what flood plain, if any, is the site located?:

Cite source(s) of information:

*K. Hark not a floodplain area, located along steep creek valley in upper reaches of an intermittent stream*

**[3] Containment**

Describe basis for selecting extreme waste management case:

Describe method(s) of waste or leachate containment for extreme case:

Cite source(s) of information:

**[8] Surface Water Use**

Use(s) of downstream surface water and sources of information:

*Some fishing and swimming  
from K. Hovl OEPA*

**Critical Habitats**

Location and description of downstream critical habitat, if any:

*None known above 500 yd flood plain*

Distance and description of points of measurement:

Cite source(s) of information:

*Mill Creek EIS  
hand upon ACE*

Population Served By Surface Water with Water Intake Within 3 Miles  
Downstream from Site

*None*

Population served by water intake(s):

Is surface water within 3 miles in a tidal estuary?: *No*

Description(s) and location(s) of intake(s) and corresponding population served by each:

How was population counted or computed?:

Cite source(s) of water-intake and population information:

AIR PATHWAY

☒ Evidence of Release

None

Describe contaminant and monitoring which reveal that background levels have been exceeded?:

Cite source(s) of information:

☒ Physical State/Volatility --

Physical state of waste and source(s) of information:

Vapor pressure of waste and source(s) of information:

Reactivity

Reactive substances and source(s) of information:

NFPA level for each and basis of selection:

Incompatibility

Incompatible substances which are present and source(s) of information:

Basis for selecting incompatibility score: